

Work Order ID 54542

December 11, 2009 11:11:48 AM



Page 1

Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 12/11/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 12/28/2009 Req'd Qty: 1.00



Customer:

Reference: Return 2009 / RA109101

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

05-12-11

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

Draw Nbr

Revision Nbr

D212-664-247

Rev B

100

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

Original B50801 @ CHG001. Ref NCR09-089.

1 hole in the cuff was slightly mis-aligned. Determined from investigation was a tolerance stack up.

Re-work to be done per Eng. Disposition (e-mail)

ANK

12-11

# Work Order ID 54542

December 11, 2009 11:11:48 AM



Page 2

Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 12/11/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 12/28/2009 Req'd Qty: 1.00



Customer:

Reference: Return 2009 / RA109101

Run Start



Appro: Process Plan: Date: Tooling: Date:

Stop



QC: Date: SPC (Y/N): Date:

ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
110		0.00							



Crosstubes

Crosstubes

## Memo

0.00

See attached e-mail by David S  
1-Dis-assemble the affected cuff

ml 10/01/04

2-Clean & alodine as necessary per QSI005

ml 10/01/04

3-Pick new D3660-1 cuff to install onto the tube.

4-Install the affected cuff per dwg, and CAREFULLY drill open the through bolt holes to 0.391" per attached e-mail. Sikaflex -241 / -291 A/R M  
Exp: 10/02/30

112395 ml 10/01/04

5-Drill the opposite side to 0.391" as well \*\*do not remove the cuff\*\*

10-1-4

6- Debur & touch up with alodine per QSI005.

**DART**

Dart Aerospace Ltd.  
1270 ABERDEEN ST.  
HAWKESBURY, ON, CANADA K6A 1K7

TC APPROVAL # 09-89

TEL: 1-613-632-5200

P/N	D212-664-207	CHG	CHG001
DESC	Crosstube Low Aft	STC	SH01-9
LOT	B50801	STC	SR01298NY
MODEL	Bell 204/105/210/212/UH-1	STC	

MADE IN CANADA

D2729-1

**Work Order ID 54542**

December 11, 2009 11:11:48 AM



Page 3

Item ID: D212-664-207

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Low Standard Aft

Start Date: 12/11/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 12/28/2009 Req'd Qty: 1.00



Customer:

Reference: Return 2009 / RA109101

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start



QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

120

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

Inspect with bolts &amp; T-pins.

Perform a Trial install with a set of landing gear per attached e-mail.

Record findings / Results:

DIMS OK TO EMAIL. BOLT/PINS FIT OK.  
INSTALLS INTO SADDLE ASSEMBLY OK.

*JP*  
10.02.04

130

Spray Painting per QSI005 4.2

0.00



SprayPaint

Memo

0.00

Spray Painting

Re-paint the tube as necessary Imron white per QSI 005

*MA* 10 03 02 ①

**Work Order ID 54542**

December 11, 2009 11:11:48 AM

Page 4

Item ID: D212-664-207

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Low Standard Aft

Start Date: 12/11/2009 Start Qty: 1.00

Cust Item ID:

Required Date: 12/28/2009 Req'd Qty: 1.00

Customer:

Reference: Return 2009 / RA109101

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

140

QC14- Inspect Spray Paint

0.00



QC

Memo

0.00

Quality Control

140.1 → insert clamps + Rubber cushion ready → ml 10.03.03 ①

140.2 inspect QCS → 8/10/03 ④

25 10-03-03 03

150

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

New kit &amp; paperwork required with the new batch # @ CHG001

8/16/09

HJ for CL 10/03/B

10-3-8 SL ④

160

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

8/10/03/03

④

**Work Order ID 54542**

December 11, 2009 11:11:48 AM

Page 5

Item ID: D212-664-207

Accept

Setup Start

Revision ID:

Stop

Item Name: Crosstube Low Standard Aft

Start Date: 12/11/2009 Start Qty: 1.00

Cust Item ID:

Required Date: 12/28/2009 Req'd Qty: 1.00

Customer:



Reference: Return 2009 / RA109101

Approvals: Process Plan: \_\_\_\_\_ Date: \_\_\_\_\_ Tooling: \_\_\_\_\_ Date: \_\_\_\_\_

Run Start

QC: \_\_\_\_\_ Date: \_\_\_\_\_ SPC (Y/N): \_\_\_\_\_ Date: \_\_\_\_\_

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
170  Packaging	Identify as per dwg & Stock Location: _____  Memo <i>MVA</i>	0.00  0.00				<i>643/9</i>	<i>1</i>		
180  QC Quality Control	QC21- Final Inspection - Work Order Release  Memo	0.00  0.00							

*u. 1003.11*

# Picklist Print

December 11, 2009 11:11:47 AM

Page 1

Work Order ID: 54542

Parent Item: D212-664-207

Parent Item Name: Crosstube Low Standard Aft

Comments: IPP RevE: as per ECN09-696 09.11.20 DD verified by:EC

Start Date: 12/11/2009

Required Date: 12/28/2009

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
---------------------------------	------------------------	---------------	-------------	---------------------	------------------	-----------------	--------------------	----------------	--------------------------	---------------	----------------	--------

D3660-1		Manufactured	No			140	Each	19.0000	1.0000			
---------	--	--------------	----	--	--	-----	------	---------	--------	--	--	--



CUFF

Warehouse Loc Qty Loc Code

Location

Main Warehouse

ST

9

51394

9

Main Warehouse

ST477

10

53501

10

CR3212-4-06

Purchased

No

220

Each

1,706.000 22.0000



CHERRY RIVET

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

1706

107534

6

112492

200

112612

500

112724

200

112794

800

Bo 112314

m/ 10/01/04

**Jason Murdoch**

---

**From:** Chris Provencal [cprovencal@dartaero.com]  
**Sent:** December 11, 2009 9:01 AM  
**To:** Jason Murdoch  
**Subject:** FW: NCR D212-664-207

---

**From:** David Shepherd [mailto:dshepherd@dartaero.com]  
**Sent:** December 3, 2009 1:11 PM  
**To:** 'Chris Provencal'  
**Subject:** RE: NCR D212-664-207

Chris,

As discussed, I'm not a big fan of elongating the holes. Would suggest opening up all saddle holes to 0.391 and trying to re-install the crosstube into a landing gear assembly. For the side with the cuff already installed, don't bother removing the cuff. Just line drill to 0.391.

David

---

**From:** Chris Provencal [mailto:cprovencal@dartaero.com]  
**Sent:** Thursday, December 03, 2009 9:00 AM  
**To:** 'David Shepherd'  
**Subject:** NCR D212-664-207

David,

Qty(1) D212-664-207. The crosstube was returned because the one saddle hole (top-most), would not allow passage of the bolt. The hole in the cuff / tube was misaligned (this is a riveted-on cuff design). They changed the cuff with no improvement, so the problem is the hole in the tube. The solution would be to file the inner hole until a bolt can pass through, similar to what is sometimes done on tri-beam holes.

The misalignment seems to be more side-to-side, so it's likely the bolt would still bear on both the inner/outer cuff. Additionally, the analysis was done to show that the rivets can bear the entire load, so the outer cuff is able to bear the load regardless. The ICA specifies limits on hole elongation, although in this case the outer hole would remain unchanged, so their inspections should not be affected.

-Chris

No virus found in this incoming message.

Checked by AVG - [www.avg.com](http://www.avg.com)

Version: 8.5.426 / Virus Database: 270.14.91/2542 - Release Date: 12/03/09 07:32:00

12/11/2009

**5.2 STANDARD GEAR CROSSTUBES**

Item	-107	-207	-209	Part Number	Description
	X			D212-664-107	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
		X		D212-664-207	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
			X	D412-664-209	CROSSTUBE INSTALLATION, 412 STANDARD AFT
6	1			D212-664-147	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD FWD
7		1		D212-664-247	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K STANDARD AFT
8			1	D412-664-249	CROSSTUBE ASSEMBLY, 412 STANDARD AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
31			2	* D2856-600-1009	ABRASION STRIP
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
45	2			* D3659-1	CUFF
46		2	2	* D3660-1	CUFF
47	44	44		* CR3212-4-06	RIVET (M7885/3-4-06)
48			44	* CR3212-4-07	RIVET (M7885/3-4-07)
50	1	1		D3428-1	PLACARD

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-147/-247 OR D412-664-249 ASSEMBLIES ABOVE  
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA  
SKIDTUBES.

• COPYRIGHT © 2001 BY DART AEROSPACE LTD •  
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED  
OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.

Revision: F  
Date: 08.09.05



REJECTED

Date: 2005-14-09

Part No: D212-664-207

Part Name: AFT CROSS BOW SKID

Serial No: 35680

Total Time:

Time Since O/H:

Inspected by:

A/c:

Remarks: RH TUBE INSERT

OUTER SLEEVE BOLT HOLE

MISALIGNED

Over:

727 B Wood

Lakeside, AZ 859

(928) 368-6966